13. An electromechanical valve assembly for an internal combustion engine, comprising:

a rotor centered about a first axis having a bore extending generally axially therethrough, said rotor having a first helical groove;

a stator operatively disposed about said rotor for producing a torque to cause rotation of said rotor about said first axis, said stator being formed of a plurality of laminated plates;

a valve having a valve stem and a valve head, said valve stem extending generally axially through said bore of said rotor, said valve stem having a second helical groove, said first and second helical grooves forming a raceway between said rotor and said valve stem for holding ball bearings therein and,

a plurality of ball bearings disposed within said raceway wherein said valve moves axially responsive to rotation of said rotor to move said valve head against a valve seat in said engine to prevent gas flow into or out of an engine cylinder.

14. An electromechanical valve assembly for an internal combustion engine, comprising:

a rotary electric actuator having a rotatable ballnut; and,

a valve having a valve stem and a valve head, said valve stem operatively connected to said ballnut, said valve stem configured to move generally axially responsive to the rotation of said ballnut to selectively engage and disengage said valve head with a valve seat on a cylinder head of said engine.

17. A control system for a linear actuated electromechanical valve assembly, said valve assembly including a valve controlling fluid communication through a line connected with a cylinder of an internal combustion engine, said control system comprising:

a valve controller for generating a commanded valve position current to control the incremental axial position of said valve; and,

a position sensor generating a signal responsive to an axial position of said valve, and wherein said valve controller can vary an opening rate and a closing rate of said valve.

Please add new claims 22-36.

22. The method of claim 1 wherein said first direction of rotation of said rotor corresponds to a counterclockwise rotation with respect to said stator.

23. An electromechanical valve assembly for an internal combustion engine, said valve assembly being at least partially disposed within an engine head between an engine cylinder and a gas conduit in said engine, said assembly comprising:

a rotor centered about a first axis;

a stator operatively disposed about said rotor for producing a torque to cause rotation of said rotor about said first axis; and,

a valve having a valve stem and a valve head, said valve configured to move said valve head against a valve seat in said engine head when said rotor rotates in a first direction to prevent gas flow communication between said engine cylinder and said conduit.

24. An electromechanical valve assembly for an internal combustion engine, said valve assembly controlling gas communication between an engine cylinder and a gas conduit in said engine, said assembly comprising:

a rotor centered about a first axis;

a stator operatively disposed about said rotor for producing a torque to cause rotation of said rotor about said first axis; and,

a valve having a valve stem and a valve head, said valve configured to move said valve head toward a valve seat of said engine when said rotor rotates in a first direction, said valve head movement being stopped upon an indication that said valve head has seated against said valve seat.

25. The electromechanical valve assembly of claim 24 wherein said indication corresponds to a measured position of said valve head being equal to a predetermined position of said valve when said valve head seats against said valve seat.

26. An internal combustion engine, comprising:

an engine cylinder; and,

a camless valve assembly having a valve communicating with said engine cylinder, said assembly adjusting an opening rate of said valve to control gas flow into said engine cylinder.

27. The internal combustion engine of claim 26 wherein said camless valve assembly can further adjust at least one of a valve dwell time, a valve closing rate, a valve open dwell position, and an initial valve opening time.

28. The internal combustion engine of claim 26 wherein said camless valve assembly includes an electrically driven ball-screw arrangement to axially move a valve head.

29. An internal combustion engine, comprising:

an engine cylinder; and,

a camless valve assembly having a valve communicating with said engine cylinder, said assembly adjusting an opening rate of said valve to control gas flow out of said engine cylinder.

30. An internal combustion engine, comprising:

an engine cylinder; and,

a camless valve assembly having a valve communicating with said engine cylinder, said assembly adjusting an opening rate and closing rate of said valve to control gas flow communicating with said engine cylinder.

31. An internal combustion engine, comprising:

an engine cylinder; and,

a camless valve assembly having a valve communicating with said engine cylinder, said assembly adjusting a closing rate of said valve to control gas flow into said engine cylinder.

32. An internal combustion engine, comprising:

an engine cylinder; and,

a camless valve assembly having a valve communicating with said engine cylinder, said assembly adjusting a closing rate of said valve to control gas flow out of said engine cylinder.

33. A control system for an electromechanical valve assembly, said assembly controlling fluid communication between a line and an engine cylinder, comprising:

a position sensor generating a signal responsive to an axial position of said valve; and,

a controller operably connected to said position sensor, said controller generating a commanded valve position signal to adjust an opening rate of said valve to control gas flow communication between said line and said engine cylinder.

34. A control system for an electromechanical valve assembly, said assembly having a valve controlling fluid communication between a line and an engine cylinder, comprising:

a position sensor generating a signal responsive to an axial position of said valve; and,

a controller operably connected to said position sensor, said controller generating a commanded valve position signal to adjust a closing rate of said valve to control gas flow communication between said line and said engine cylinder.

35. A method for controlling a valve assembly in an engine, said assembly having a rotatable ballnut and a valve configured to move along a first axis in response to rotation of said ballnut, said method comprising:

rotating said ballnut to move a valve head against a valve seat of said engine; and,

stopping said rotation of said ballnut upon an indication that said valve head has contacted said valve seat to prevent gas flow into or out of an engine cylinder.